Federated Observatory Data files from the International Arctic Systems for Observing the Atmosphere (www.IASOA.org) Network

Increasing Accessibility to Arctic Atmospheric (and Surface) Data

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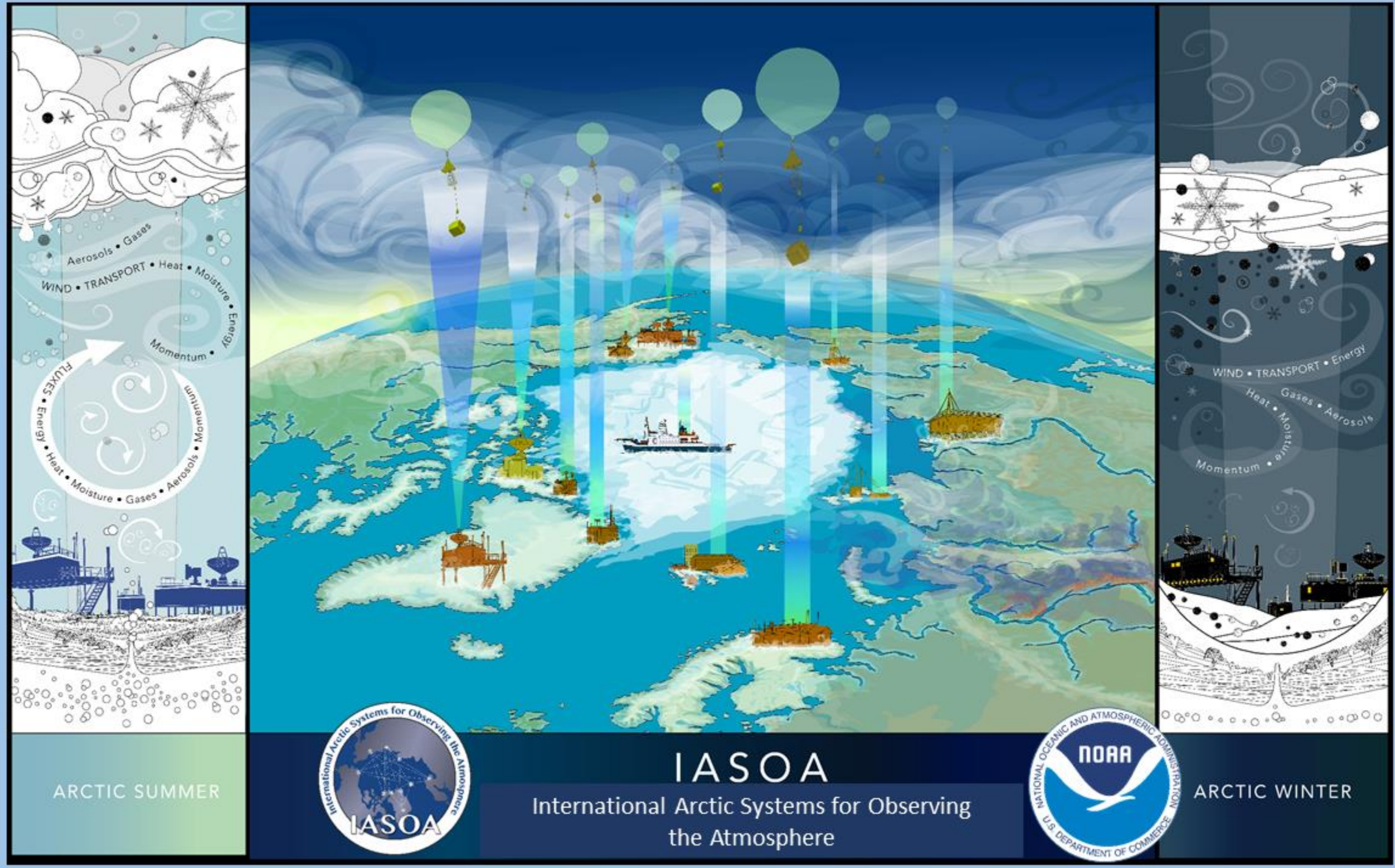
Aerosols • Gases
WIND • TRANSPORT • Heat • Moisture • Energy
Momentum •
FLUXES
Energy • Heat • Moisture • Gases • Aerosols • Momentum
WIND • TRANSPORT • Energy
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Momentum •
ARCTIC SUMMER
International Arctic Systems for Observing the Atmosphere
IASOA
IASOA
International Arctic Systems for Observing the Atmosphere
NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE
ARCTIC WINTER


radiometrics
CORPORATION


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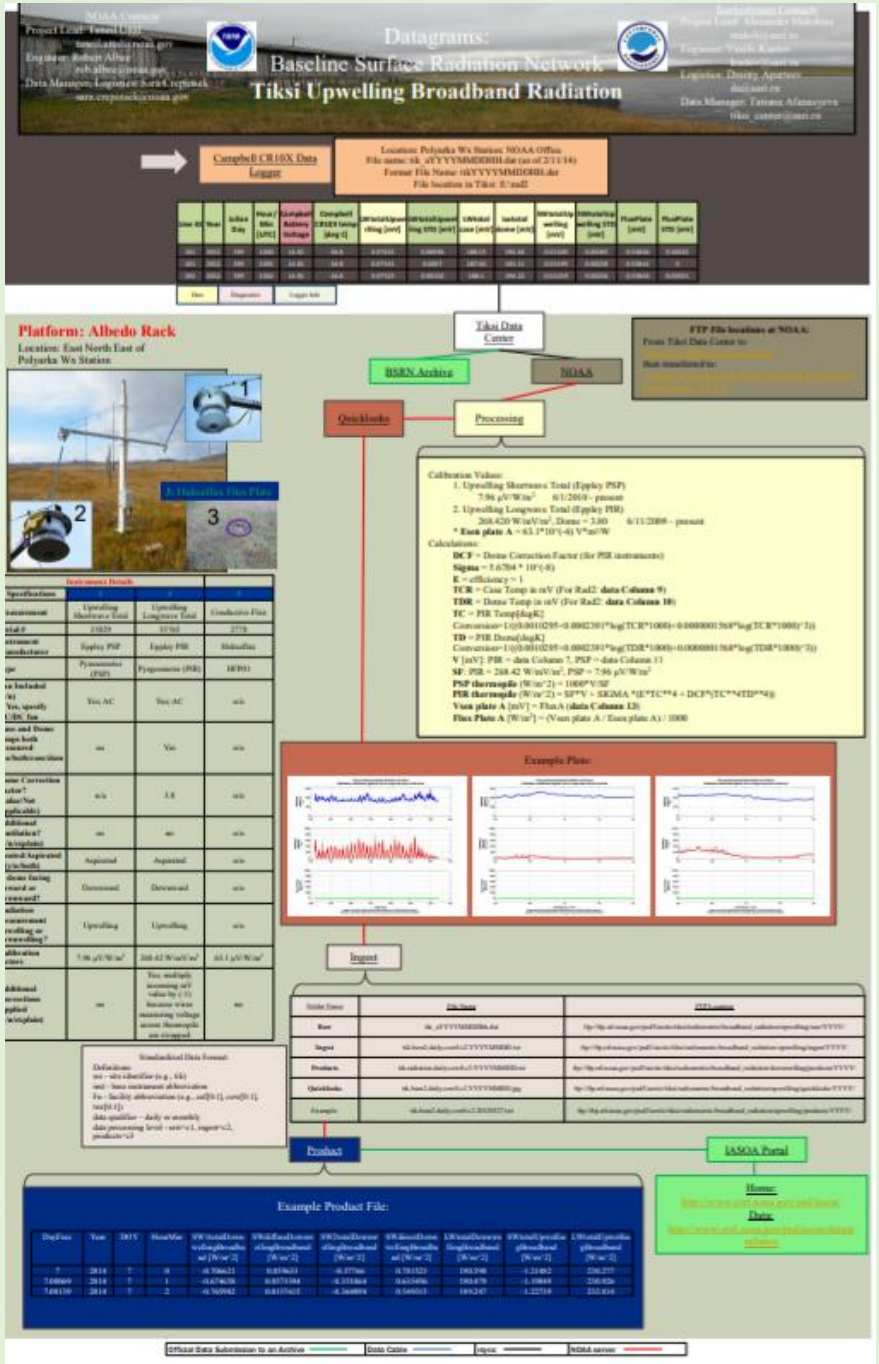
Ask me about Datagrams! Taneil.Uttal@noaa.gov)



Complex process just to get to 2 variables

Upwelling Long Wave (W/m^2)
Upwelling Short Wave (W/m^2)

(No writing a line of code and generated a consistent variable on a global grid)

Current Requirement: WMO Year of Polar Prediction VERIFICTION PLANS: Supersite Multi-Variate High-Frequency Observations: An Opportunity for Model Process Evaluation

S YOPP Super Sites are all IASOA sites

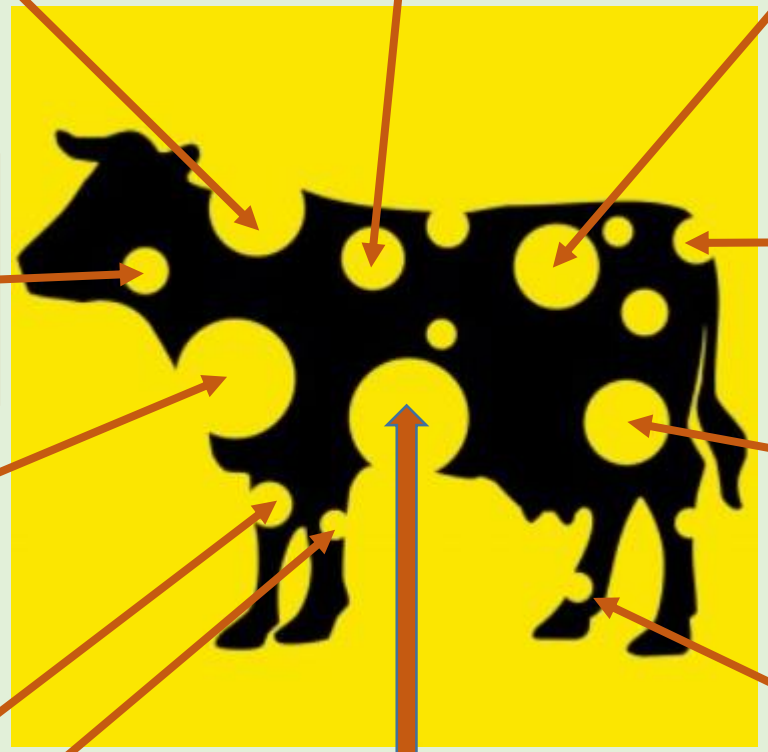
YOPP
YEAR OF POLAR PREDICTION

A Common set of **Model** Outputs
Implies the need for a
A Common set of **Observation** Outputs

However are we going to do that?

A truly holey plan!

ATTRIBUTION



A single variable (even something simple like temperature) may be collected redundantly, qc-ed and processed differently and or derived with different retrieval methods so expert selection must made of which value to use

Global archives (GAW, BSRN, AeroNET, ebas, are for a narrow range of variables) and typically are not up to date

There is a serious under-estimate and resulting lack of resources for data processing, archiving

Portals require that target repositories have (consistent) metadata

A wide community of potential users (gridded data people) want a consistent network product

Data is collected at non-operational research stations which are sometimes and sometimes not co-located with operational weather stations (if not, no consistent meteorology)

Essential variables are established for a wide variety of different mostly) research objectives

Instruments are operated by different countries, organizations and institutions even at the same observatory

Grant funded research groups tend to embargo (especially processed) data

THE DATA AT RESEARCH STATIONS IS INTENDED TO SUPPORT INDIVIDUAL LINES OF RESEARCH LEADING TO AN ENDPOINT OF A PEER REVIEWED RESEARCH PUBLICATIONS

Dictionary

We are going to need “Federated data sets”

fed·er·ate

verb
past tense: **federated**; past participle: **federated**
/ˈfedəˌrāt/

(with reference to a number of states or organizations) form or be formed into a single centralized unit, within which each state or organization keeps some internal autonomy.
"In 1901 the six colonies federated to form the Commonwealth of Australia"
synonyms: confederate, combine, unite, unify, merge, amalgamate, integrate, join (up), band together, team up
"several tribes federated in an attempt to stem the tide of white colonial expansionism"

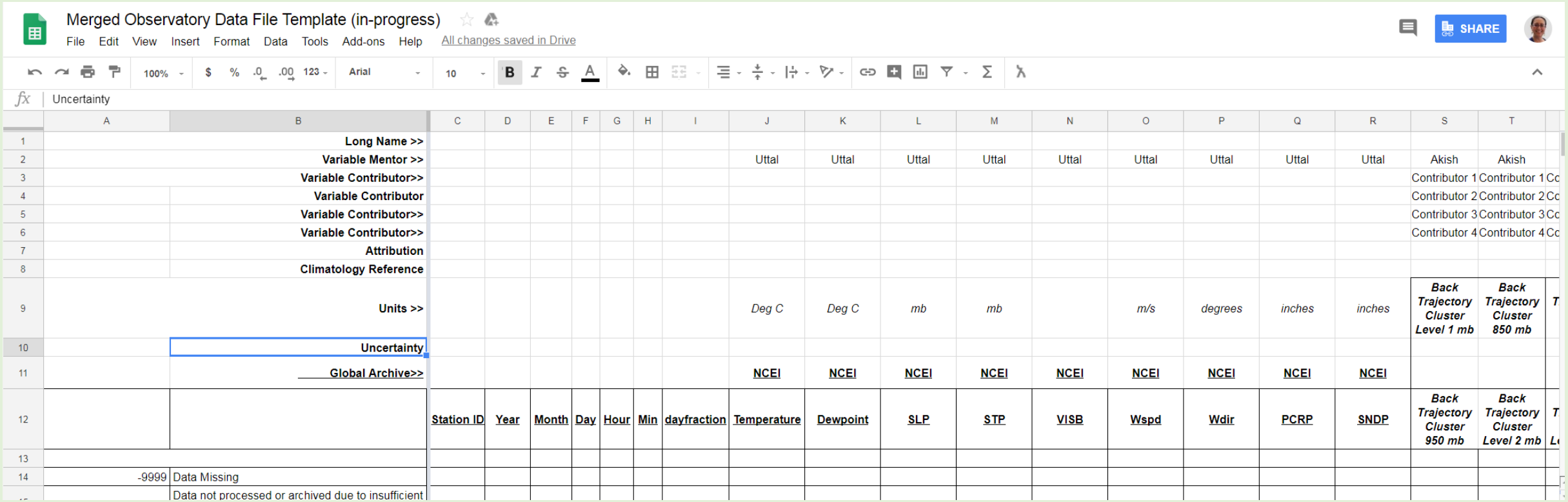
Proposed Attributes for the IASOA Merged Observatory Data Files (MODFs) for YOPP

- Essential variables include not only those determined by A common set of model output for YOPP but also by science objectives established by the IASOA Working Groups
- There will be one MODF per observatory per Special Observing Period.
- The MODFs will NOT be created real-time
- MODFs will be consistent with YOPP model output files and will internally match variables, time interval and averaging conventions, levels and units and externally match output formats (TBD)
- Surface meteorological variables will be acquired consistently for all stations from NOAA/NCEI
- Each variable will processed consistently for all observatories, typically with a single individual/team responsible for processing assigned variables for all observatory MODFs rather than establishing processing format/procedure/requirement protocols and relying on processed contributions from individual researchers
- IASOA working group specialists will determine most usable and representative MODF values for the many variables (e.g. turbulent fluxes) that have multiple measurement and derivation techniques

Continued……

- The atmosphere-surface variables inventory will be expanded to include green-house gases and atmospheric constituents not identified as YOPP priority variables.
- “Missing” data flagging protocols will be developed to accommodate the fact different observatories have different permutations of instruments and measurement capabilities, data may be embargoed, data exists but has failed QC, resources may not be available for processing etc.
- Uncertainty estimates will be included with units information
- The initial MODFs will be for the YOPP 2018 special observing periods (Feb-Mar and June-July-Aug).
- Each observatory and SOP specific MODF will have an individual doi.
- Each MODF will internally and externally attribute all contributing parties
- The MODFs generated specifically for YOPP may be hosted by ACTRIS (https://www.actris.eu/) as well as by IASOA (www.iasoa.org)
- The provenance of each variable will be established and policies will be develop to accommodate and document the situation when individual MODF variables constitute either duplicate or alternative products that are generated from the same original raw data and products that may be served through other archives

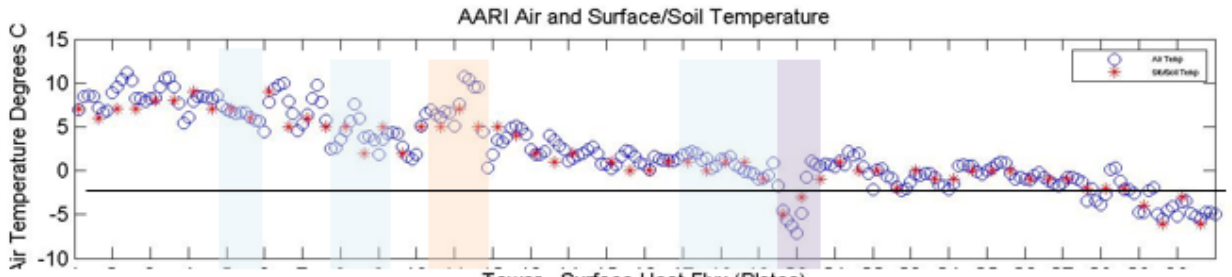
https://docs.google.com/spreadsheets/d/1VG395nwpwX7UWHHVystTsi6h5OoouvQa67Oi5Z0e3xI/edit#gid=0

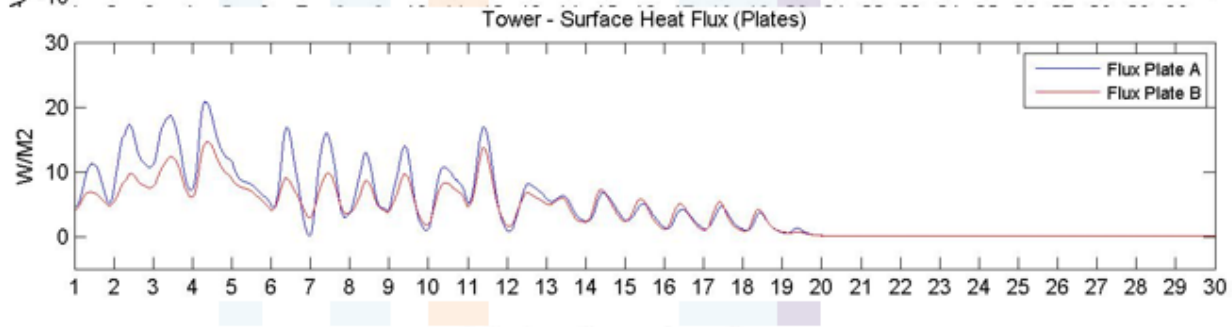


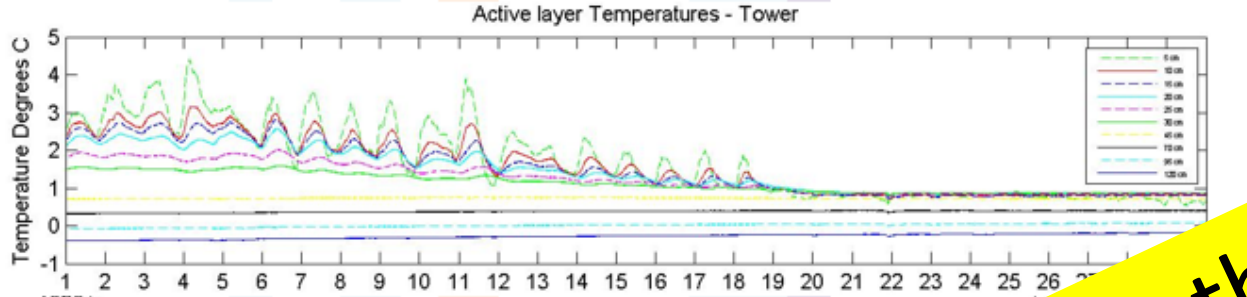
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1		**Long Name >>**																		
2		**Variable Mentor >>**								Uttal	Uttal	Uttal	Uttal	Uttal	Uttal	Uttal	Uttal	Uttal	Akish	Akish
3		**Variable Contributor>>**																	Contributor 1	Contributor 1 Cc
4		**Variable Contributor**																	Contributor 2	Contributor 2 Cc
5		**Variable Contributor>>**																	Contributor 3	Contributor 3 Cc
6		**Variable Contributor>>**																	Contributor 4	Contributor 4 Cc
7		**Attribution**																		
8		**Climatology Reference**																		
9		**Units >>**								*Deg C*	*Deg C*	*mb*	*mb*		*m/s*	*degrees*	*inches*	*inches*	***Back Trajectory Cluster Level 1 mb***	***Back Trajectory Cluster 850 mb***
10		**Uncertainty**																		
11		**Global Archive>>**								**NCEI**	**NCEI**	**NCEI**	**NCEI**	**NCEI**	**NCEI**	**NCEI**	**NCEI**	**NCEI**		
12			**Station ID**	**Year**	**Month**	**Day**	**Hour**	**Min**	**dayfraction**	**Temperature**	**Dewpoint**	**SLP**	**STP**	**VISB**	**Wspd**	**Wdir**	**PCRP**	**SNDP**	***Back Trajectory Cluster 950 mb***	***Back Trajectory Cluster Level 2 mb***
13																				
14	-9999	Data Missing																		
		Data not processed or archived due to insufficient																		

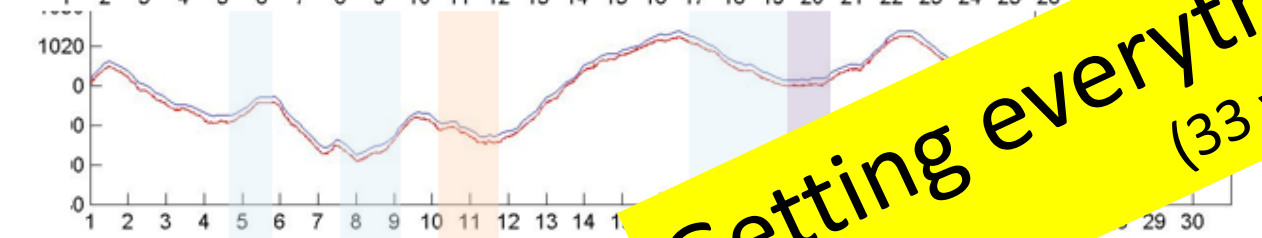
38 + variable columns

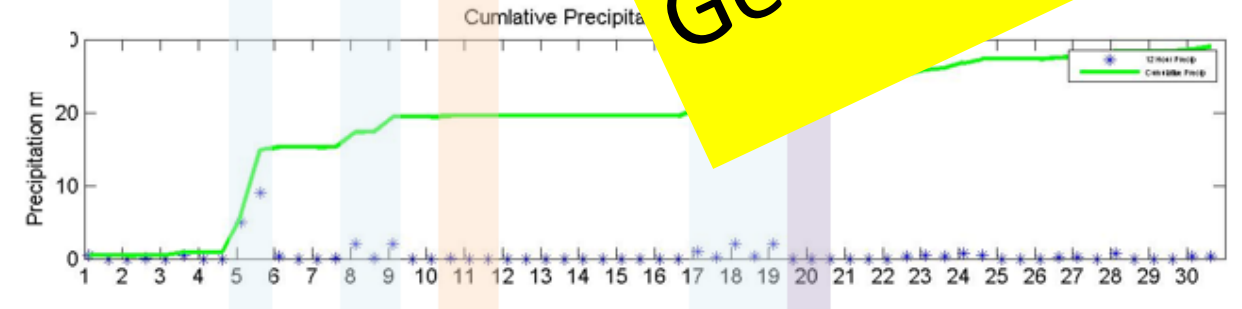
	SOP1	SOP2	SOP3
ALERT, Canada	doi:	doi:	doi:
EUREKA, Canada	doi:	doi:	doi:
WHITE HORSE, Canada	doi:	doi:	doi:
IQALUIT, Canada	doi:	doi:	doi:
OLIKTOK POINT, USA	doi:	doi:	doi:
UTIAQVIK (BARROW), USA	doi:	doi:	doi:
TIKSI, RUSSIA	doi:	doi:	doi:
CAPE BARANOVA, RUSSIA	doi:	doi:	doi:
VILLUM STN, Greenland	doi:	doi:	doi:
SUMMIT, Greenland	doi:	doi:	doi:
SOLDANKYLA, FINLAND	doi:	doi:	doi:
SVALBARD, NORWAY	doi:	doi:	doi:

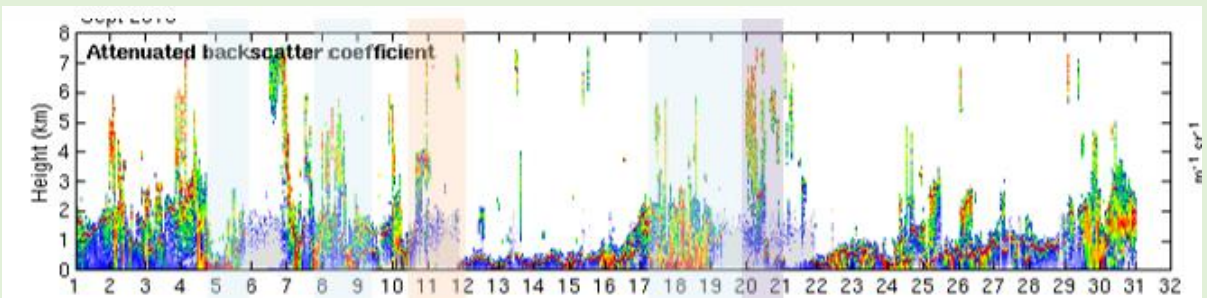


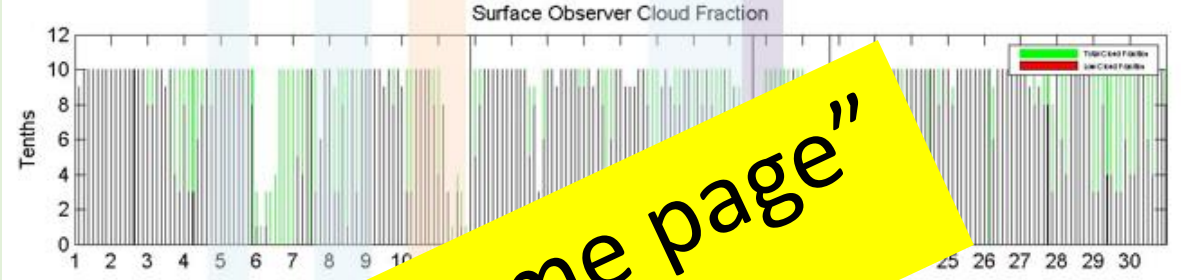


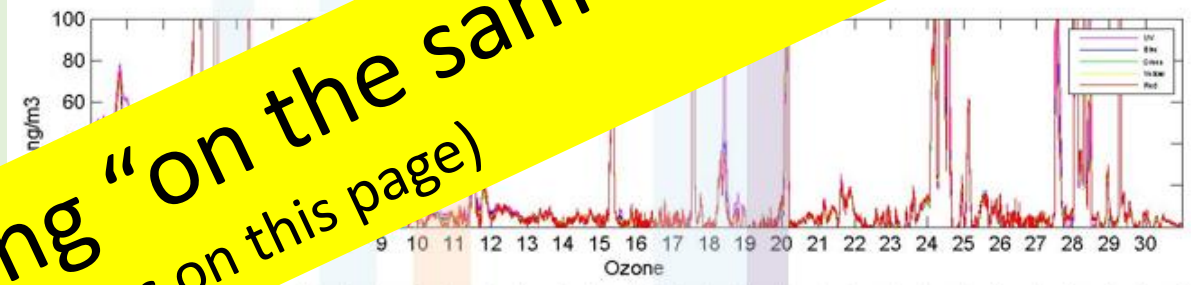


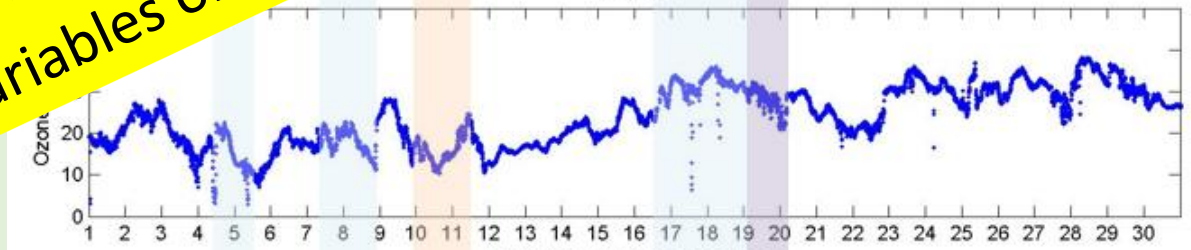


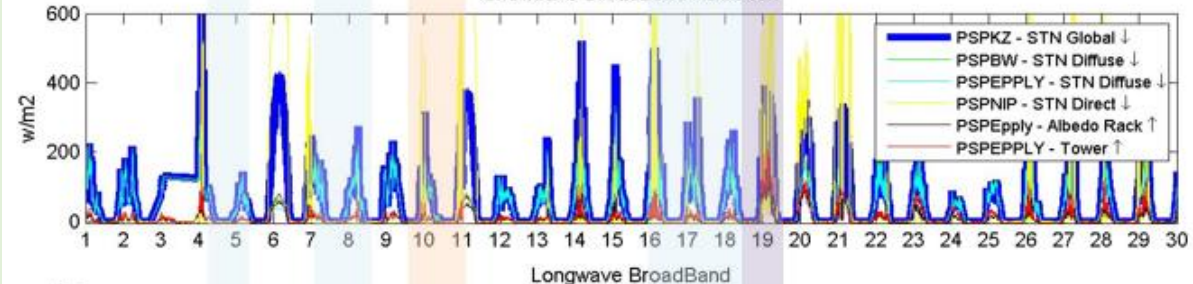












Getting everything "on the same page"

(33 variables on this page)

Potential Application for MODFs Template Across Complex NOAA Observational Data Collections?

- **Arctic Research Program Oceanographic Data (Merged Distributed Biological Observatory Data Files - MDBODFs**
- **NOAA Ship Cruise Data (Merged Ship Data Files – MSDFs)**
- **Baseline Observatories (Merged Baseline Observatory Data Files – MBODFs)**
- **NOAA Aircraft Flights (Merged Aircraft Flight Data Files – MAFDFs)**